UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,353	06/23/2005	Klaus Hoffesommer	H 2293US	8385

1218 7590 05/20/2010

HESPOS & PORCO LLP
110 West 40th Street
Suite 2501
NEW YORK, NY 10018

EXAMINER	
TRAN, THUAN Q	
ART UNIT	PAPER NUMBER
3693	

MAIL DATE	DELIVERY MODE
05/20/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/510,353	HOFFESOMMER, KLAUS	
	Examiner	Art Unit	
	Thuan Tran	3693	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2010 and 04 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,8-15,19,20,22-68 and 73-82* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,8-15,19,20,22-68 and 73-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 June 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4-23-2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1-4-2010 has been entered.

Status of Claims

1. This action is in reply to the amendment filed on 1-4-2010 and the RCE filed 2-4-2010.

2. Claims 1, 15, 29, 43, 57-68 have are currently amended.

3. Claims 1, 8-15, 19, 20, 22-68 and 73-82 are currently pending and have been examined.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 4-23-2010 was filed in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Response to Arguments

5. Applicant's arguments with respect to the previous 34 USC 101 and 112 2nd paragraph rejections, filed 1-4-2010, have been fully considered and are persuasive. The previous 34 USC 101 and 112 2nd paragraph rejections have been withdrawn.

6. Applicant's arguments with respect to the 35 USC 103 rejections of the claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1, 8-15, 19, 20, 22-68 and 73-82 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 states in part, "deriving, by the computer, the optimized order of assignment from the optimized network flow distribution by assigning the supply vertices to the demander vertices in correspondence to the flow values of the connecting edges." The applicant addresses this question on page 38 of the remarks filed 1-4-2010, however, the claim remains unclear. What is the order of assignment, in other words, what is assigned first, second, third, and so on in the following cases:

a) The flow values are discontinuous or not continuously ordered numbers starting from the number one.

b) The flow values are not whole numbers

c) When multiple connecting edges have the same flow values.

Please clarify.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. **Claims 1, 8-15, 19, 20, 22-68 and 73-80** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt US Patent 7,037,919 in view of Ahuja et al., Network Flows.

11. **As per claim 1, 15, 29, 43, 57, 61 and 65:**

Hunt teaches:

- building a network (see at least FIG 8 and column 26 line 50 to column 27 line 13)
- in which the transmission lines are represented by transmission vertices connected to a sink vertex via sink edges of a flow capacity which represents the transmission rate of the respective transmission line, the sink vertex being sink of a network flow (see at least FIG 8 and column 26 line 50 to column 27 line 13);
- in which the senders are represented by sender vertices connected to a source vertex via source edges of a flow capacity which represents the data rate of the

respective sender, the source vertex being source of a network flow (see at least FIG 8 and column 26 line 50 to column 27 line 13); and

- in which transmission vertices and sender vertices are connected by edges of certain flow capacities (see at least FIG 8 and column 26 line 50 to column 27 line 13);
- determining an optimized network flow distribution of flow values through the edges by an iterative flow-method (see at least FIG 8 and column 27 line 14-37); and
- deriving the optimized order of assignment from the optimized network flow distribution by assigning the transmission vertices to the sender vertices in correspondence to the flow values of the connecting edges (see at least FIG 8 and column 27 line 14-37).
- determining an optimized network flow distribution of flow values through the edges by an iterative flow-method comprising the following steps a) to e):
    - a) repeated discharge operation for all active demander vertices, which are defined as vertices at which the sum of the incoming flow is higher than the sum of the outgoing flow along an edge being admissible according to a labeling function, where the following rule applies: If the excess flow to be pushed from an active demander vertex is greater than the residual capacity of some current edge where the residual capacity of an edge is the capacity of the edge minus the flow that has already been pushed along this edge and if there is another admissible edge leaving

this vertex with a residual capacity which at least equals the excess flow, then the flow will be pushed along the edge with sufficient residual capacity (see at least FIG 8 and column 27 line 14-37);

- b) pushing excess flow from security vertices to the sink along edges with a non zero residual capacity (see at least FIG 8 and column 27 line 14-37);
- c) setting vertices with excess flow active and updating the excess flow of each vertex (see at least FIG 8 and column 27 line 14-37);
- d) repeated discharge operation for all active supply vertices where flows are pushed back to demander vertices (see at least FIG 8 and column 27 line 14-37) and where the following rules apply:
  - 1. a flow on an edge leaving a demander vertex that has no other edge leaving this demander vertex and leading to another supply vertex is never pushed back (see at least FIG 8 and column 27 line 14-37);
  - 2. if the flow that had been pushed along a current edge from the demander vertex is equal to the capacity of the edge then other edges that are admissible according to a labeling function would have priority under the condition that (see at least FIG 8 and column 27 line 14-37):
    - i) If there is another admissible edge according to the labeling function from some demander vertex to the supply

vertex with a flow that is less than the capacity of the edge and at least equal to the excess flow then the excess flow of supply vertex is pushed back along this edge to the demander vertex (see at least FIG 8 and column 27 line 14-37);

- ii) if there are other admissible edges to this supply vertex according to the labeling function where for each edge the flow is less than the capacity and where the sum of flows along these other edges is at least equal to the excess flow of the supply vertex then the excess flow is pushed back along these edges to the respective demander vertices (see at least FIG 8 and column 27 line 14-37);

- e) setting demander vertices with excess flow after the reflow from supply vertices active and updating the excess flow of each vertex (see at least FIG 8 and column 27 line 14-37);
- where the steps a) to e) are iteratively repeated until the flow the sink vertex equals a min s-t-cut value or there is no more active vertex or the number of iterations has reached a maximum value (see at least FIG 8 and column 27 line 14-37);

Hunt does not specifically teach all of the different applications for the use of this optimization algorithm. However, Ahuja teaches the different applications of network flow problems. Specifically, Ahuja teaches:

Optimizing the order assignment of a number of supplies (processors) to a number of demanders (tasks, see at least Application 12.9, "Scheduling on Parallel Machines" on pages 468-469).

Balancing a number of loan accounts with a number of collateral securities, where each loan account has a certain loan value and each collateral security has a certain security value (see at least last paragraph on page 568).

Optimizing the order of assignment of a number of tasks to a number of processors, where each processor has a certain processor capacity and each task has a certain capacity demand (see at least Application 12.9, "Scheduling on Parallel Machines" on pages 468-469).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the network flow optimization algorithm to the different applications of Ahuja with motivation to solve these similar problems within a known amount of time.

Examiner notes: The rejection of dependent claims 8-14, 19-20, 22-28, 44-56 58-60, 62-64, 73-74, 76-78, and 80 are obvious in view of the rejection of claims 29-42.

12. **As per claims 30:**

Hunt further teaches:

- wherein in the iterative flow-method comprises a discharge operation pushing a flow from an active vertex at which the sum of the incoming network flow is higher than the sum of the outgoing network flow along an admissible edge,

where the admissibility of an edge is defined by a label of the vertex connected to the active vertex by the respective edge (see at least FIG 8 and column 26 line 50 to column 27 line 37).

13. **As per claims 31:**

Hunt further teaches:

- further comprising a relabeling operation changing the label of the active vertex if there is no admissible edge along which the discharge operation can be performed (see at least FIG 8 and column 26 line 50 to column 27 line 37).

14. **As per claims 32:**

Hunt further teaches:

- wherein, when the label of the vertex to be discharged is Y(v) and the label of a vertex connected by an edge is Y(w), said edge being admissible if Y(v) = Y(w) + 1, and wherein the label Y(v) of the vertex to be discharged is increased by one in the relabeling operation (see at least FIG 8 and column 26 line 50 to column 27 line 37).

15. **As per claims 33:**

Hunt further teaches:

- comprising discharge operations pushing flows from sender vertices to transmission vertices and discharge operations pushing flows from transmission

vertices to sender vertices (see at least FIG 8 and column 26 line 50 to column 27 line 37).

16. **As per claims 34:**

Hunt further teaches:

- wherein the discharge operation is performed iteratively for sender vertices and transmission vertices (see at least FIG 8 and column 26 line 50 to column 27 line 37).

17. **As per claims 35:**

Hunt further teaches:

- determining an upper limit of the highest possible total flow through the edges (see at least FIG 8 and column 27 line 14-37); and
- iteratively distributing the network flow through the edges until at least one of the conditions is fulfilled (see at least FIG 8 and column 27 line 14-37):
- i) the network flow corresponds to the upper limit of the highest possible total flow (see at least FIG 8 and column 27 line 14-37),
- ii) the sum of the incoming network flow at a vertex equals the sum of the outgoing network flow of said vertex for each transmission vertex and for each sender vertex,
- iii) the number of iterations has reached a given maximum value.

Examiner Note: Only one of the conditions is particularly pointed out because of the applicant's use of the phrase "at least one of" in the claim language.

18. **As per claims 36:**

Hunt further teaches:

- wherein assigning the transmission vertices to the sender vertices is performed by an iterative assigning operation (see at least FIG 8 and column 27 line 14-37).

19. **As per claims 37:**

Hunt further teaches:

- wherein the assigning operation, in a first stage, assigns a transmission vertex to a sender vertex only if these vertices are connected by an edge for which the flow value equals the capacity (see at least FIG 8 and column 27 line 14-37).

20. **As per claims 38:**

Hunt further teaches:

- wherein the assigning operation first assigns transmission vertices to such sender vertices which are connected to the respective transmission vertex by an edge for which the flow value equals the flow value of the corresponding source edge before it assigns transmission vertices to such sender vertices which are connected to the respective supply vertex by an edge for which the flow value is equal to or higher than a remaining flow value of the corresponding sink edge

which has not yet been assigned to a sender vertex (see at least FIG 8 and column 27 line 14-37).

21. **As per claims 39:**

Hunt further teaches:

- wherein the first stage is performed until all transmission vertices and sender vertices which are connected by edges for which the flow value equals the capacity are assigned (see at least FIG 8 and column 27 line 14-37).

22. **As per claims 40:**

Hunt further teaches:

- wherein the assigning operation, in a second stage, assigns a transmission vertex to a sender vertex if the flow value of the connecting edge corresponds to the flow value of the corresponding source edge reduced by a fraction of its data rate already assigned to a transmission vertex, or to the flow value of the corresponding sink edge reduced by a fraction of its transmission rate already assigned to a sender vertex (see at least FIG 8 and column 27 line 14-37).

23. **As per claims 41:**

Hunt further teaches:

- wherein the assigning operation, in the second stage, first assigns such transmission vertices to sender vertices for which the flow value of the

connecting edge corresponds to the flow value of the corresponding source edge reduced by a fraction of its data rate already assigned to a transmission vertex (see at least FIG 8 and column 27 line 14-37).

24. **As per claims 42:**

Hunt further teaches:

- wherein the certain flow capacity of an edge connecting a sender vertex to a transmission vertex is given by the smaller one of the capacity of the respective source edge and the capacity of the respective sink edge (see at least FIG 8 and column 27 line 14-37).

25. **As per claims 66:**

Hunt further teaches:

- wherein the input units are formed by a single input unit (see at least column 10 line 25 to column 11 line 67).

26. **As per claims 67:**

Hunt further teaches:

- wherein the input units are integrated into a single device (see at least column 10 line 25 to column 11 line 67).

27. **As per claims 68:**

Hunt further teaches:

- wherein the network construction unit, the network flow unit, and the assignment unit are realized by a single calculator unit (see at least column 10 line 25 to column 11 line 67).

28. **As per claims 75:**

Hunt further teaches:

- Computer program product for optimizing the data transfer through a transmission system comprising a number of senders and a number of transmission lines comprising instructions which, when loaded into a computer, cause said computer to perform a method as claimed in claim 29 (see at least column 10 line 25 to column 11 line 67).

29. **As per claims 79:**

Hunt further teaches:

- Storage medium comprising stored data which represent a computer program product as claimed in claim 75 (see at least column 10 line 25 to column 11 line 67).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuan Tran whose telephone number is 571-270-1832. The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Kramer can be reached on 571-272-6783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thuan Tran/
Examiner, Art Unit 3693

/Stefanos Karmis/
Primary Examiner, Art Unit 3693